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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/666,409	09/19/2003	Johan M. Gunther	5200	7452

7590 06/30/2006

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750 East Green Street #303
Pasadena, CA 91101

EXAMINER

SPAHN, GAY

ART UNIT	PAPER NUMBER
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3673

DATE MAILED: 06/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/666,409		GUNTHER, JOHAN M.	
	Examiner		Art Unit	
	Gay Ann Spahn		3673	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 10, 20-24 and 26-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10 is/are allowed.
- 6) ☒ Claim(s) 20-24 and 26-29 is/are rejected.
- 7) ☒ Claim(s) 1 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>04 April 2006</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 04 April 2006 was filed after the mailing date of the first Non-Final Office Action on 08 July 2004. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement has been considered by the examiner.

However, the examiner notes that references which were listed on a Notice of References Cited (PTO-Form-892) attached to Paper No. 06092004 have been lined through as having been already considered. More particularly, U.S. Patent No. 5,228,809 to Yoshida et al., U.S. Patent No. 4,461,362 to Staggs et al., U.S. Patent No. 5,542,786 to Blum, U.S. Patent No. 5,944,446 to Hocking, U.S. Patent No. 6,238,142 to Harsch, U.S. Patent No. 6,116,819 to England, U.S. Patent No. 5,967,700 to Gunther, U.S. Patent No. 4,940,366 to Suzuki, U.S. Patent No. 4,286,900 to Sugimoto, Japanese Patent Document No. JP 57-108313A to Kodama et al., Japanese Patent Document No. JP 58-127828A to Yamada et al., and Japanese Patent Document No. JP 02209519a to Tsuchihiro have all been lined through as having already been considered. The remainder of the references have been initialed as having been considered.

Claim Objections

Claims 1 and 20 are objected to because of the following informalities:

(1) claim 1, line 33, after the word "being", the word --a-- should be inserted;

(2) claim 20, line 38, it is believed that the words "with a" at the beginning of the line should be deleted;

(3) claim 20, line 39, it is believed that a comma punctuation mark (i.e., --,--) should be inserted at the end of the line; and

(4) claim 20, line 42, it is believed that after the word "formation,", the word --and-- should be inserted.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 20, 22, 23, 26, and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by GUNTHER (U.S. Patent No. 5,967,700).

As to claim 20, GUNTHER discloses a method of forming an in-situ piling in a soil formation (12) with a dry binder and sufficient water to produce a stoichiometrically correct mixture, comprising:

with a rotary tool (15) drilling into said formation (12; see Fig. 1), said tool (15) having a rotary shaft (20) that has a central axis of rotation and a vane (auger 30 has vane-like outer wall of arms 32 and 33; see col. 3, lines 41-43) for drilling into and

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mixing the soil (12), rotated around and moved axially by said shaft (20), said vane (auger 30 has vane-like outer wall of arms 32 and 33; see col. 3, lines 41-43) being so disposed and arranged as to move through the formation along a helical path to drill into said formation (12), to stir the material of the formation (12), and ultimately to mix the material of the formation (12) with water and binder;

a water injector (43, 44, 45) and a dry binder injector (60) carried by said tool (15);

driving said tool (15) axially into and out of said formation (12) while rotating it;

at some times during axial movement of said tool (15), discharging said water from said water injector (43, 44, 45, or 60) into said soil formation (12) along an axis of emission of said water and discharging said dry binder from said binder injector (60) into said soil formation (12) along an axis of emission of said dry binder under continuous control of the rate of supply of each, both said axes of emission being radially directed away from said tool (15) into said soil formation (12) at a respective location along said central axis (21) of said shaft (20), so that said water and said dry binder being emitted from said water injector (43, 44, 45, or 60) and said binder injector (60), respectively, will during a limited number of revolutions of said shaft (20) encounter one another to become a mixture at various depths as a pre-determined ratio of water and dry binder, said ratio being responsive to requirements at the respective depth, said water including water emitted from said water injector (43, 44, 45, or 60) and water which may have already been present at that depth in said soil formation (12), and said mixture of water and binder further including material of the formation (12) being temporally made.

As to claim 22, GUNTHER discloses the method of claim 20 as discussed above, and GUNTHER also discloses that injection of binder is made during passage of said tool out of said soil formation (see col. 4, lines 44-45).

As to claim 23, GUNTHER discloses the method of claim 20 as discussed above, and GUNTHER also discloses that injection of water is made during passage of said tool into said soil formation (see col. 4, lines 36-40).

As to claim 26, GUNTHER discloses the method of claim 20 as discussed above, and GUNTHER also discloses that the emission of one of said injectors is encountered in said soil formation in a temporally suitable time related to the curing of the binder and drainage of the water (see col. 2, lines 20-30).

As to claim 29, GUNTHER discloses the method of claim 20 as discussed above, and GUNTHER also discloses that the pressure of the stream of water and of the binder in the tool is above the ambient pressure which exists in the formation (see col. 4, lines 14-30; the mixture of dry lime and dry cement is injected under a pneumatic pressure or about 4,000 psi which is clearly greater than ambient pressure, and although it does not say what pressure the water is jetted out at, it would have to be a pressure greater than ambient or else the water would not jet out).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over GUNTHER (U.S. Patent No. 5,967,700), as applied to claim 20 above.

As to claims 21 and 24, GUNTHER discloses the method of claim 20 as discussed above.

However, GUNTHER fails to explicitly disclose that injection of binder is made during passage of said tool into said soil formation, and that injection of water is made during passage of said tool out of said soil formation.

It is well settled that reversal of parts is a well known obvious expedient. See *In re Gazda*, 219 F.2d 449, 104 USPQ 400 (CCPA 1955), wherein prior art disclosed a clock fixed to the stationary steering wheel column of an automobile while the gear for winding the clock moves with steering wheel; mere reversal of such movement, so the clock moves with wheel, was held to be an obvious expedient.

Therefore, to have reversed the injection of binder from being done during passage of the tool out of the soil formation as taught by GUNTHER to being done during the passage of the tool into the soil formation, and to have reversed the injection of water from being done during passage of the tool into the soil formation as taught by GUNTHER to being done during the passage of the tool out of the soil formation, would have constituted an obvious expedient to one having ordinary skill in the art at the time the invention was made.

Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over GUNTHER (U.S. Patent No. 5,967,700), as applied to claim 20 above, and further in view of HOCKING (U.S. Patent No. 5,944,446).

As to claim 27, GUNTHER discloses the method of claim 20 as discussed above.

However, GUNTHER fails to explicitly disclose that the emission of water is determined by a program responsive to data from a representative core.

HOCKING discloses an apparatus for injection of mixtures into subterranean formations comprising injection outlet ports (2) with radial isolation vanes (3) and flexible diaphragms (4) for independent control of injection pressures and flow rates in different directions. HOCKING further discloses control valves (11), a computer providing feedback control (10) and pumping system (5). Injection pressures and flow rates are interactively modified and thereby modify a mixture composition according to calculation and responses from detection devices (see abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the valve means of GUNTHER to incorporate programmable control, as taught by HOCKING because GUNTHER clearly acknowledges that benefit of programmable controls for valve operation. HOCKING's teaching further enhances the GUNTHER invention by providing programmable valve control for the ground improving injection fluid mixture, for more automation and convenience within the system.

As to claim 28, GUNTHER discloses the method of claim 20 as discussed above.

However, GUNTHER fails to explicitly disclose that the emission of water is determined by a program responsive to data relating to water content already in the soil derived from a sensor on said tool disposed at an axial location below the place of injection of said binder.

HOCKING discloses an apparatus for injection of mixtures into subterranean formations comprising injection outlet ports (2) with radial isolation vanes (3) and flexible diaphragms (4) for independent control of injection pressures and flow rates in different directions. HOCKING further discloses control valves (11), a computer providing feedback control (10) and pumping system (5). Injection pressures and flow rates are interactively modified and thereby modify a mixture composition according to calculation and responses from detection devices (see abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the valve means of GUNTHER to incorporate programmable control, as taught by HOCKING because GUNTHER clearly acknowledges that benefit of programmable controls for valve operation. HOCKING's teaching further enhances the GUNTHER invention by providing programmable valve control for the ground improving injection fluid mixture, for more automation and convenience within the system.

Further, it would have been obvious to one of ordinary skill in the art at the time of the invention modify the disclosure of GUNTHER to incorporate detection devices, as taught by HOCKING, because GUNTHER clearly acknowledges that benefit of soil testing at various depths, as disclosed above. Provision of devices to further detect and sense conditions below the surface are another method of determining water conditions

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for more accurately determining the binder/water ratio of the resulting binder composition to figure out and project the ultimate physical properties of the modified earthen mixture.

Allowable Subject Matter

Claim 10 is allowed.

Claim 1 would be allowable if amended to overcome the objections discussed above.

Response to Arguments

Applicant's arguments filed 04 April 2006 have been fully considered but they are not persuasive.

Applicant's argue that:

Nothing is said in the '700 patent about providing in the bore itself what is a pre-mix of water and binder at respective depths. In the '700 patent it is all to put the water in, and then to add the cement. There is no reference to limited numbers of revolutions or anything related to time.

In fact, the number of revolutions is applicable only to this instant application, because the distance the tool travels axially is a function of the number of revolutions. Then the amounts of binder (and their location in the bore) and the water are known. The accurate mixture occurs outside of the tool, in the bore. The cement may arrive a few moments after the binder, but the lapse of time is not significant.

As to the number of revolutions they relate to the concurrence of binder and water injections. In the '700 patent this is not intended. Instead the water is injected, and then the cement added is at a significantly later time with no reference to timeliness at any particular depth.

The Examiner's valued suggestions for this claim have been adopted with thanks, except that the word "simultaneous" for emission of water and binder has not been used. Almost all of the time it will be simultaneous, but when the nozzles for water and binder are perhaps 6

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inches axially apart, and maybe 180 degrees around, it can occasionally be the situation where for a specific station in the piling the water which it receives and the binder which it receives, will involve a short delay. This is not simultaneous, but it is temporal. It all occurs within such a short time that the water cannot drain away too soon.

In the embodiments where the jets meet in the bore, they will be simultaneous. However where the water and binder nozzles are axially spaced, short time gap will exist, but is acceptable. It is submitted that claim 20 as amended attends to this problem.

The examiner disagrees that the new claim language of the last paragraph of claim 20 recites anything that is not taught by GUNTHER. If Applicant had recited "simultaneously" like the examiner suggested in her 35 U.S.C. § 112, second paragraph rejection on page 7 of the Office Action mailed on 29 November 2006, claim 20 would be allowable. However, the "temporally" language presently in line 43 of amended claim 20 does nothing to read over GUNTHER.

According to Merriam-Webster's Collegiate® Dictionary (Tenth Edition, Copyright 1997, published by Merriam-Webster, Incorporated, Springfield, Massachusetts), the word "temporal" is defined as "1a: of or relating to time as opposed to eternity b: of or relating to earthly life c: lay or secular rather than clerical or sacred : CIVIL <lords ~> 2: of or relating to a grammatical tense or a distinction of time 3a: of or relating to time as distinguished from space b: of or relating to the sequence of time or to a particular time : CHRONOLOGICAL -- **tem•po•ra•ly** *adv.*" The examiner sees nothing in this definition which aids claim 20 in reading over GUNTHER.

Further, Applicants argue that "[t]he cement may arrive a few moments after the binder, but the laps of time is not significant." The examiner disagrees that the lapse of time is not significant in the method because any lapse of time is met by GUNTHER.

Applicants argue that “[n]othing is said in the '700 patent about providing in the bore itself what is a pre-mix of water and binder at respective depths.” However, the claim does not recite this either. Claim 20 uses the language of “at some time during axial movement of said tool.” This means both going down and going up, or at any given increment of the tool going down or going up.

The claim does not specify that both water and dry binder are discharged at the same time from the water injector and dry binder injector, respectively. Thus, even though the water is injected on the way down or at the appropriate depth in GUNTHER and dry binder is injected afterwards, the claim language of claim 20 is met.

The recitation of “said water and said dry binder being emitted from said water injector and said binder injector, respectively, will during a limited number of revolutions of said shaft encounter one another to become a mixture at various depths” is relied upon by Applicant because he states that GUNTHER has “no reference to limited numbers of revolutions.” However, the examiner notes that “a limited number of revolutions of said shaft” is a relative term and as such, is met by GUNTHER. In other words, GUNTHER discloses revolutions of the shaft (see col. 4, lines 41-42) and thus, the water and dry binder will meet during “a limited number of revolutions of said shaft,” particularly since it has not been disclosed as to how many revolutions there are in a limited number.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gay Ann Spahn whose telephone number is (571)-272-7731. The examiner can normally be reached on Monday through Thursday, 8:30 am to 7:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patricia L. Engle can be reached on (571)-272-6660. The fax phone number for the organization where this application or proceeding is assigned is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Gay Ann Spahn, Patent Examiner
June 25, 2006


PATRICIA L. ENGLE
PRIMARY EXAMINER